A1 (cont'd) second interface chamber adduct ions traveling into the chamber are converted into sample ions without fragmentation of sample ions whereby to increase the sample ion current and therefore the sensitivity of the mass spectrometer system.

3. A method of mass analyzing sample ions produced at atmospheric pressure and introduced into a mass analyzer disposed in a vacuum chamber, and in which some sample ions and solvent molecules combine to form adduct ions with a reduction of sample ions comprising the step of dissociating the adduct ions prior to entry into the mass analyzer to form sample ions to increase the sample ion current entering into the mass analyzer.

A2 4. The method of operating a mass spectrometer system including a mass analyzer which analyzes sample ions formed at atmospheric pressure, and in which some sample ions and solvent molecules combine to form adduct ions with a reduction of sample ions, said system including first and second multipole ion guides disposed in serial first and second evacuated chambers separated by an ion lens for guiding analyte ions into said mass analyzer and an ion lens defining the first evacuated chamber which comprises

applying a DC offset voltage between a selected one or both ion lenses and the succeeding multipole ion guide having an amplitude so as to provide translational kinetic energy to said adduct ions to dissociate the adduct ions without dissociating sample ions at the pressure of the second chamber to increase the sample ion current and the sensitivity of the mass spectrometer system.

A3 9. The method of analyzing ions in a mass analyzer which includes a first chamber maintained at a first pressure and a second chamber maintained at a lower pressure comprising the steps of:

forming sample ions at atmospheric pressure with some of the sample ions combining with solvent ions to form adduct ions,

guiding said sample ions and adduct ions through at least a first chamber maintained at a first pressure and a second chamber maintained at a lower pressure,

adding translational kinetic energy to said adduct ions as they travel through said chambers such that in the second chamber the adduct ions are dissociated without fragmenting the sample ions prior to entering the mass analyzer.